ENVIRONMENTAL ANALYSIS
OF POST-2004
OPERATIONAL ALTERNATIVES
FOR THE
CENTRAL VALLEY PROJECT

Prepared for

THE BUREAU OF RECLAMATION

By

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Background and Purpose

The purpose of this report is to examine the Central Valley Project (CVP) operational alternatives being reviewed by Reclamation, and to compare those alternatives to the operational constraints and opportunities contained in the Central Valley Project Improvement Act Programmatic Environmental Impact Statement (CVPIA PEIS) and the Sierra Nevada Region of the Western Area Power Administration's (Sierra Nevada Region) 2004 Marketing Plan (2004 Plan). The intent of the comparison is to determine if the alternatives are within the parameters of the CVPIA PEIS and the 2004 Plan EIS, and if the alternatives are likely to create or cause an environmental impact.

CVPIA. The general purposes of the CVPIA, as identified by Congress in §3402 of Public Law 102-575, are as follows:

(a) to protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California;
(b) to address impacts of the CVP on fish, wildlife, and associated habitats;
(c) to improve the operational flexibility of the CVP;
(d) to increase water-related benefits provided by the CVP to the State of California through expanded use of voluntary water transfers and improved water conservation;
(e) to contribute to the State of California's interim and long-term efforts to protect the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; and
(f) to achieve a reasonable balance among competing demands for use of CVP water, including the requirements of fish and wildlife, agriculture, municipal/industrial and power contractors.

Operational analyses developed within the CVPIA PEIS alternatives did not attempt to optimize power generation. Operational flexibility for power generation is reduced in all alternatives. Changes in CVP operations, especially increased releases for instream flows in the Trinity River Basin, are expected to shift patterns of CVP power generation. In all alternatives, peak CVP power generation would shift from summer months to the spring and fall

months (when demand for hydropower is lower). The cost of replacement power generation to meet summer month loads may increase the overall cost of power supplies to CVP preference power customers.

The CVPIA PEIS defines additional specific operating criteria for the CVP, primarily to meet fish and wildlife needs. These operational constraints will alter the ability of the CVP to generate power. The CVPIA PEIS does not, however, identify additional constraints on the marketing of CVP power.

2004 Marketing Plan. The broad purposes of the 2004 Plan are as follows:

- to be consistent with Sierra Nevada Region's statutory and other legal constraints;
- to provide long-term resource and contractual stability for the Sierra Nevada Region and for customers contracting with the Sierra Nevada Region;
- to provide the greatest practical value of the power resource to the Sierra Nevada Region and to customers contracting with the Sierra Nevada Region;
- to protect the human and natural environment; and
- to be responsive to future changes in the CVP, the Washoe Project, and the utility industry.

In developing alternatives for the 2004 Plan, the Sierra Nevada Region focused on six key elements of the marketing program that could vary across the alternatives. The key elements are as follows:

1) *Baseload Operations* – Within the operational constraints established by the U.S. Department of the Interior (Interior), this refers to releasing water from hydroelectric facilities to generate electricity at a relatively constant rate. This approach would emphasize a steady water release rate from dams above regulating reservoirs.

2) *Peaking Operations* – Within the operational constraints established by Interior, this refers to storing and releasing water from hydroelectric facilities to generate electricity during the relatively short period of maximum demand. This approach would emphasize

periodic water releases from dams above regulating reservoirs timed to produce electricity when it is most needed.

3) *Power Purchases* – These refer to Sierra Nevada Region power purchases used to supplement the CVP. Purchases may come from various power markets in California, the Pacific Northwest, and the Desert Southwest.

4) *Renewable Resources* – These resource types are emphasized in one alternative and could be acquired through either selective purchases or allocations of CVP power to Sierra Nevada Region customers active in developing renewable resources.

5) *Power Cost Analysis* – This refers to analyzing cost impacts to Sierra Nevada Region's customers from combining the costs for purchases and CVP resources (aggregated) or treating these resources individually, each with its own cost (disaggregated).

6) *Allocation to Customer Groups* – This refers to assessing the impacts of changing the quantities of power that customer groups currently receive from the Sierra Nevada Region. Customers are divided into the following three groups, with the customers in each group having similar load characteristics: utilities, agriculture, and other (e.g. State and Federal agencies).

The preferred alternative identified in the 2004 Plan EIS attempts to schedule CVP hydropower facilities to maximize power generation during peak load periods within current operating constraints. While various allocations are made across the three identified customer groups, no allocation assumptions are made with respect to individual customers. Specific allocations to customers will be made in a separate process.

Additional Reclamation Law. As currently defined by the River and Harbors Act of 1940, CVP facilities are required to be used first for river regulation, improvement of navigation, and flood control; second for irrigation and domestic water users; and third for power. Several state and federal initiatives have added water quality and environmental constraints on the CVP. In most instances, operation of the CVP considers water quality and environmental constraints second only to flood control. In addition, Reclamation Law

recognizes (through the Reclamation Act of 1939) that generation from Reclamation projects is available be used to meet project use loads. Any surplus power can then be sold to preference customers (including irrigation and reclamation districts, cooperatives, public utility districts, municipalities, and large educational or government facilities), and finally to other customers (such as investor-owned utilities). Sales of surplus power are priced to meet the repayment of the project, and may not be priced in order to make a profit.

Types of Impacts

For purposes of this analysis, several types of potential impacts were considered. Also, for this analysis, the terms "impact" and "effect" are used interchangeably. In environmental documents, impacts refer to physical changes in the environment while effects refer to social and economic changes. Also, social and economic changes resulting from a project are treated somewhat differently under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). CEQA does not treat economic and social changes resulting from a project as significant effects on the environment. However, if economic and social effects cause a physical change in the environment, the physical change may be regarded as a significant impact using the same criteria for other physical changes from the project. In addition, economic and social effects of a project may be used to assess the significance of a physical impact. Under NEPA, economic and social effects must be discussed if they are interrelated to the natural or physical environmental impacts of a project. Methods to avoid or reduce adverse social and economic effects must also be addressed.

Effects on CVP Preference Power Customers. Effects of the operational alternatives on CVP preference power customers (e.g. municipalities, districts, state and federal agencies), other CVP wholesale power customers (e.g. PG&E or other investor-owned utilities), and the retail customers of CVP wholesale power customers (both preference and other) were considered. Potential effects include changes in total available energy deliveries, the timing of energy deliveries, the reliability of energy deliveries, and the per unit cost of energy deliveries to any of the identified customer sets.

Effects on Water Users. Effects of the operational alternatives on CVP water customers (agricultural and municipal and industrial) were considered. Potential effects include changes in total available water

deliveries, the timing of water deliveries, the reliability of water deliveries, and the per unit cost of water deliveries to agricultural or municipal and industrial customers.

Environmental Impacts. Impacts of the operational alternatives on fish, wildlife and vegetation resources in the Central Valley were considered. Potential effects include changes in the anticipated viability of specific fish, wildlife or vegetation species (with particular emphasis on Threatened and Endangered species), and changes in available habitat (including stream flow, wetlands, and riparian habitat).

Social and Economic Effects. Effects of the operational alternatives on economic, recreation and social resources in the Central Valley were considered. Potential effects include changes in the availability and use of recreation resources (e.g. fisheries and reservoirs), changes in a community's or region's economic base, and changes in the physical or social make-up of a community.

Environmental justice concerns were also considered. Under Executive Order 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," federal agencies are required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low income populations.

Initial Impact Analyses

If an operational alternative is likely to create an impact that has not been captured within the CVPIA PEIS or the 2004 Plan EIS, that impact is identified. This analysis does not specify significance criteria. No determination, therefore, is made regarding the potential significance of any identified potential impacts. Consequently, no mitigation strategies are suggested within this report.

Alternative I. Alternative I is also referred to as the Load Following Alternative. This alternative provides that Reclamation maintain its priority of meeting project use loads from existing CVP resources on a kWh for kWh basis prior to providing power to CVP electric customers. Once project use requirements are satisfied, this alternative then assumes that CVP facilities are operated to generate electricity during the hourly periods when electric prices in the California marketplace are at their highest.

This alternative is very similar to the preferred alternative identified in the 2004 Plan EIS, and it is expected that the impacts identified in the 2004 Plan EIS also adequately describe any impacts that would be caused by this alternative. Impacts to fish, wildlife and vegetation would be limited to the physical areas immediately adjacent to CVP regulating reservoirs and were determined to be negligible in the 2004 Plan EIS. In addition, the operational and marketing flexibility provided by this alternative for the CVP power resource does not take effect until after CVP environmental requirements (including additional constraints imposed by the CVPIA) are met. No impacts were identified for the economic, recreation and social resources in the area. Water users (both agricultural and municipal and industrial) will not be impacted since the operational and marketing flexibility provided by this alternative for the CVP power resource does not take effect until after CVP water delivery requirements are met.

Any impacts to CVP power users will be positive. Operating the CVP power resource to optimize the value of the resource to customers, under the current operating constraint of meeting project use requirements from CVP generation first, will decrease the per unit melded cost of CVP customers' full energy requirement. In addition, operating the CVP in this way increases the marketable capacity of the CVP (as noted in the 2004 Plan EIS, Table 2.5). This alternative also increases the efficiency of the deregulated energy market in California, allowing for more competitive energy pricing in peak periods.

Alternative II. Alternative II is also referred to as the Maximum Peaking Alternative. The Maximum Peaking Alternative calls for project use loads to be satisfied by other non-CVP resources. This alternative then operates the CVP facilities in parallel with the highest priced periods for electricity in the California marketplace, again representing the maximum value of CVP resources. Under this alternative, project use loads are met through market purchase.

Most impacts from this alternative are similar in nature and scope to Alternative I. Impacts to fish, wildlife and vegetation would be limited to the physical areas immediately adjacent to CVP regulating reservoirs and were determined to be negligible in the 2004 Plan EIS. In addition, the operational and marketing flexibility provided by this alternative for the CVP power resource does not take effect until after CVP environmental requirements (including

additional constraints imposed by the CVPIA) are met. No impacts were identified for the economic, recreation and social resources in the area.

The availability, timing and reliability of water deliveries to CVP water users (agricultural and municipal/industrial) will not be impacted since the operational and marketing flexibility provided by this alternative for the CVP power resource does not take effect until after CVP water delivery requirements are met. If the cost of power purchases for Alternative II is assigned to the water function, the cost of water deliveries could increase. The current cost allocation method should be reviewed in greater detail to determine if this would occur, or if provisions are in place to adjust cost allocations for power purchases made for marketing purposes.

Any impacts to CVP power users will be positive. Operating the CVP power resource to optimize the value of the resource to customers will decrease the per unit melded cost of CVP customers' full energy requirement. In addition, operating the CVP in this way increases the marketable capacity of the CVP (similar to Alternative I). This alternative also increases the efficiency of the deregulated energy market in California, allowing for more competitive energy pricing in peak periods, to an even greater extent than Alternative I.

Conclusions

Anticipated impacts that would result from implementation of Alternative I appear to fall within the parameters of the alternatives examined in the 2004 Plan EIS. The impacts and/or effects (negative or positive) that Alternative I could cause are likely to be very similar to those identified for the preferred alternative in the 2004 Plan EIS.

Most anticipated impacts that would result from implementation of Alternative II are very similar in type and scope to those identified for Alternative I. One difference is that the potential may exist for increased water costs due to increased water pumping costs, depending on how pumping costs are allocated to water users under Alternative II. The potential for Alternative II to be successfully adopted and implemented would be greatly enhanced if CVP water users were "made whole," by assuring that cost allocations did not increase their cost of delivered water.

CVP power with an increased per unit cost is more likely to remain a viable component of a customer's resource mix if the CVP resource can be made

more valuable through peaking management. The creation of additional value of the power resource through peaking management may help maintain the feasibility of the CVP as a competitive alternative in California's deregulated energy market. This is essential if repayment of the project, as currently configured, is to continue without threat of default.

While the CVPIA PEIS presents additional operational constraints for the CVP, neither the CVPIA PEIS nor the 2004 Plan EIS present any additional constraints on the marketing of CVP power. However, considering 1) the intent of both the CVPIA PEIS and the 2004 Plan EIS to increase the flexibility of the CVP, 2) the potential increased cost of CVP power due to additional environmental costs, and 3) the development of a more liquid market for purchased replacement power in the California PX, it may be appropriate to consider the pursuit of statutory and/or policy changes that allow greater flexibility in the power operations of the CVP.